



# National Authority for Remote Sensing and Space Sciences (NARSS)

## African Satellite Collaborative Projects (Past, Present and Future)

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# Content

- ◆ Space agencies and programs in Africa
- ◆ African Satellite Joint space projects
- ◆ Obstacles and challenges in the way for collaboration
- ◆ A proposed model for a collaborative Satellite project
- ◆ African Space Agency



# Africa and Space race

Country	National Space Authority	No. of launched LEO satellites	No. of launched GEO satellites	Level of Space technology
Algeria	ASAL (2002)	5	(1)	Own, Design, Integrate and operate
Angola	-	-	(1)	-
Egypt	NARSS (1998) and NILESAT	2	4	Own, Design and Operate
Ethiopia	<b>ESSS (2004)</b>	(1)	-	-
Ghana	<b>GSSTC (2012)</b>	1	-	Own, Design and Operate
Kenya	KENSA (2017)	-	-	-



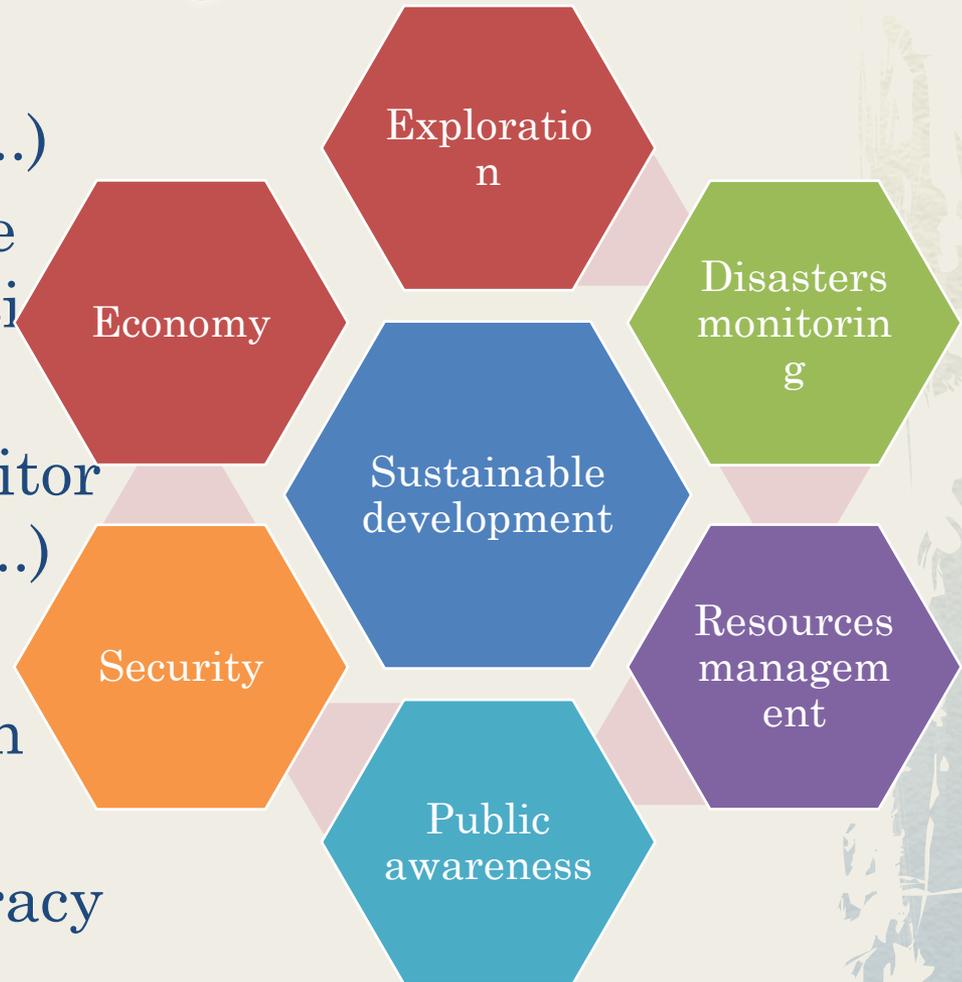
# Africa and Space race (Cont.)

Country	National Space Authority	No. of launched LEO satellites	No. of launched GEO satellites	Level of Space technology
Morocco	CRTS	1	-	Own
Nigeria	NASRDA (2001)	4	2	Own, Design and Operate
South Africa	SANSA (2010)	4	-	Own, Design, Integrate, and Operate
Sudan	ISRA (2013)	-	-	Design



# Why do African nations need Joint Projects?

- ◆ To discover the unusable resources (Minerals, water,..)
- ◆ To preserve the usage of the resources (Anti-Desertification, Wasting water, ...)
- ◆ To protect against and monitor disasters (Floods, Wildfire, ..)
- ◆ To protect the borders
- ◆ To provide services and gain money
- ◆ To eliminate the Space literacy





# Joint Projects

## African Resources Management Constellation (ARMC) 2009 (Nigeria, South Africa Kenya, and Algeria)

### ◆ Goal:

1. To provide Easy Access to satellite data for end users in Earth observation fields
2. Capacity Building
3. The development of low-cost receiving stations

### ◆ Implementation:

1. A constellation of satellites have a 2.5m resolution panchromatic imager and a 5m resolution multispectral imager in 6 multispectral bands.
2. Data from these identical satellites would be gotten through an integrated ground station.
3. From the ground station, efforts would be made to ensure that the satellite data reach the end users all over the continent, as close to real time as possible.

# Joint Projects

- ◆ So far, only Nigeria has any satellites in orbit (*NigeriaSat2*)
- ◆ South Africa almost finished the design of *EO-Sat1* and is planning to launch in 2020
- ◆ Algeria is planning for launching *Alsat-3* in 2020
- ◆ Kenya did not contribute yet



Signing of the ARMC Space Agreement, 7th December 2009 in Algiers, Algeria (Source: Algerian Space Agency)  
<https://iinitiative.wordpress.com/2009/12/21/african-resource-management-satellite/>



# Obstacles and challenges in the way for collaboration

- ◆ Lack of Long term vision by the decision makers
- ◆ Needs for legal agreements and policies
- ◆ Lack of capitals
- ◆ Needs for undergraduates Space curriculum and qualified personnel



# A proposed model for a collaborative Cubesat project

- ◆ A hosting country can provide testing and integration facilities
- ◆ Each of the interested countries can participate in design and implementation of one Subsystem
- ◆ All countries can share the cost of launching
- ◆ One or more countries can operate using the available ground stations



# Towards the African Space Agency

- ◆ Umbrella of all space activities in Africa
- ◆ Put the visions and strategies for the continent's space disciplines
- ◆ Motivate the decision makers and governments to invest more in satellite projects
- ◆ Provide short/long term project plans



# Thanks